



NU DASMARIÑAS

GESTS01X – Science, Technology and Society

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Week 7- BIODIVERSITY & ENVIRONMENTAL SUSTAINABILITY



Learning outcomes

At the end of the lesson the student should be able to:

- Identify different types of biodiversity
- Understand the importance of biodiversity in ecosystem



Biodiversity

Biodiversity is defined as the vast variety of life forms in the entire Earth

- Types: genetic, species and ecological diversity



3 types of Biodiversity

Genetic
Diversity



Species
Diversity



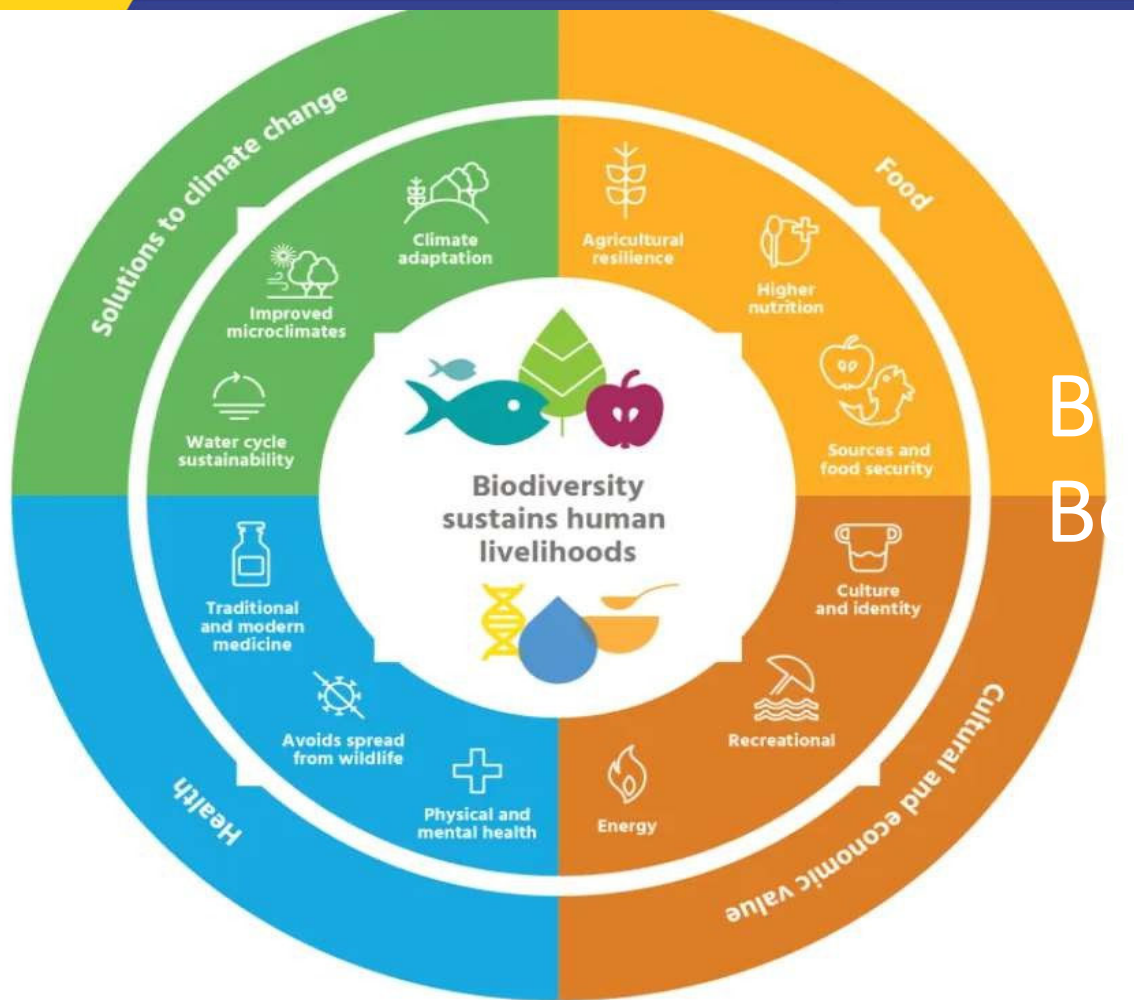
Ecosystem
Diversity



Alaska



Peru



Biodiversity
Benefits

Health and Medicine

- Since 2600BC people have been using plants to treat illnesses hence the practice of herbal medicine
- Beginning 100BC to 300BC, the Greeks recorded the collection, storage, and use of medicinal herbs
- During the Dark and Middle Ages, monasteries in England, Ireland, France and Germany preserved the western knowledge of treating illnesses using herbal medicine



Medicinal Products

Salicylic acid is a beta hydroxy **acid**. It's well-known for reducing acne by exfoliating the skin and keeping pores clear. You can find **salicylic acid** in a variety of over-the-counter (OTC) products. Dec 12, 2019



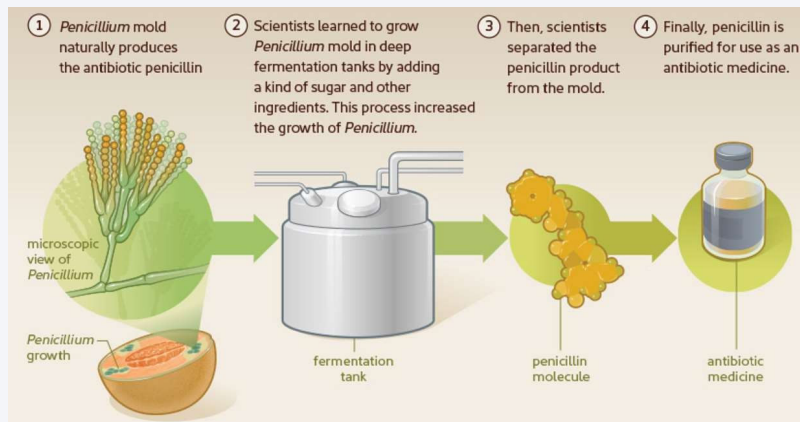
Medicinal Products



Papaver somniferum, commonly known as the opium **poppy** or breadseed **poppy**, is a species of flowering plant in the family Papaveraceae. It is the species of plant from which both opium and **poppy** seeds are derived and is also a valuable ornamental plant, grown in gardens.

Species: *P. somniferum*

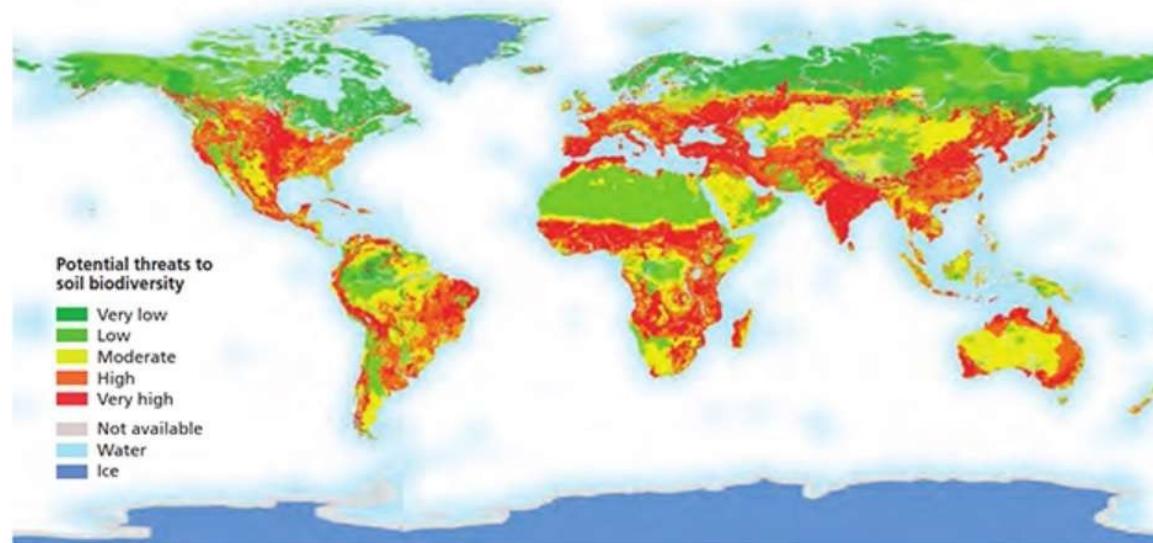
Family: [Papaveraceae](#)



Medicinal Products

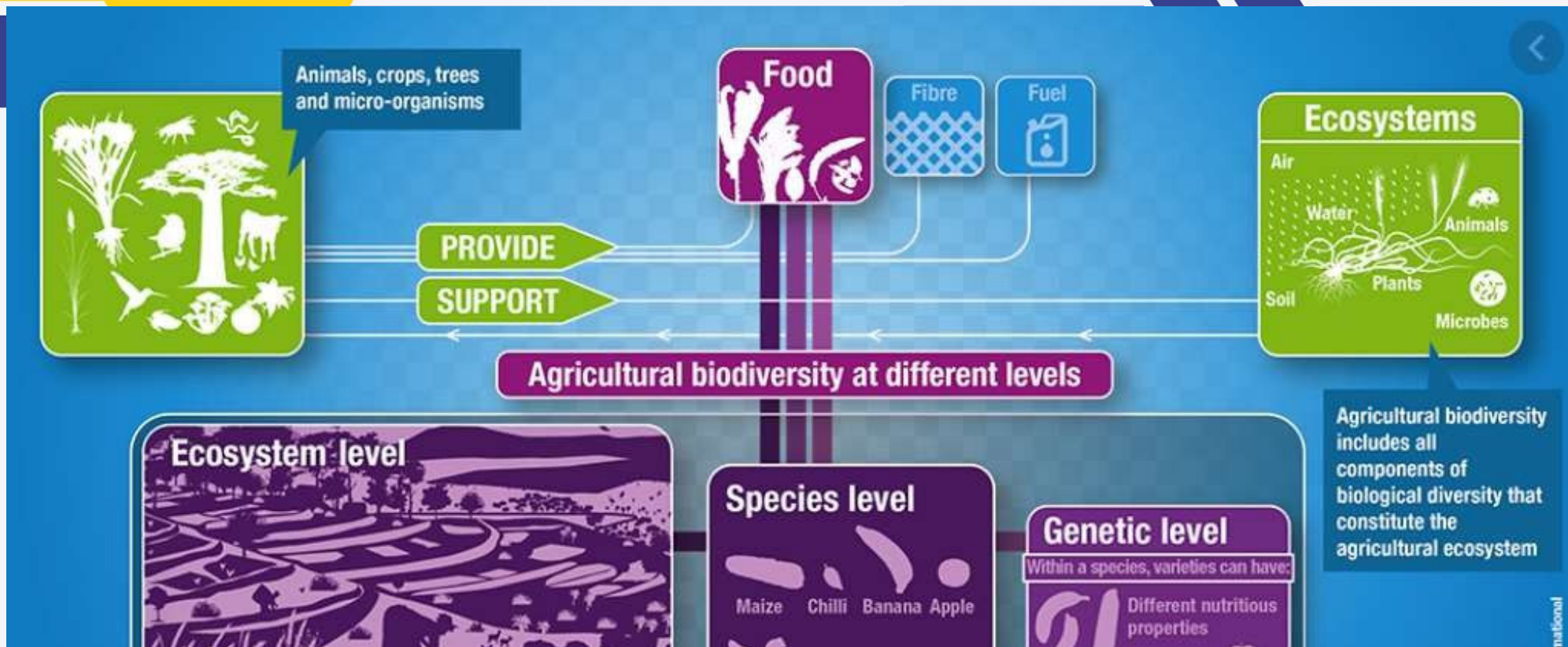
discovery of novel antibiotic structural classes such as norcardicins, carbapenems, and monobactams

Map of potential threats to soil biodiversity



A comparative map of threats to soil biodiversity from factors including agricultural intensity, pollution, erosion, fire and climate change.

Source: European Union and U.N. Food and Agriculture Organization



Agrobiodiversity



Energy

Risks of energy in biodiversity

The effects of the environment and the risk of potential accidents when using energy alarmed many environmental organizations.

Some examples include:

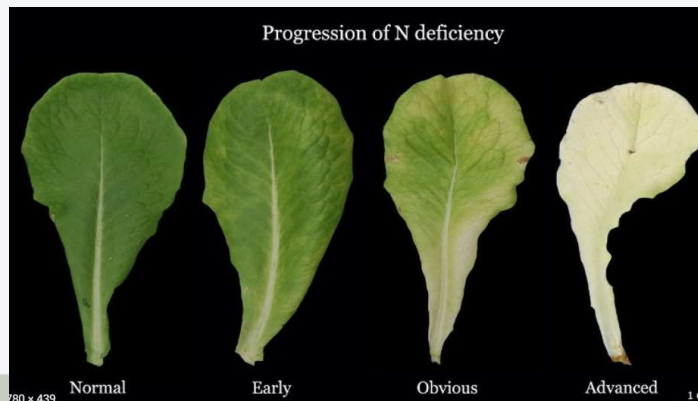
- March 28, 1979: Three Mile Island nuclear power plant accident (<https://youtu.be/Ev6IJOIROto>)
- Exxon Valdez was the worst oil spill in U.S. waters (<https://www.history.com/topics/us-states/history-exxon-valdez-oil-spill-video>)



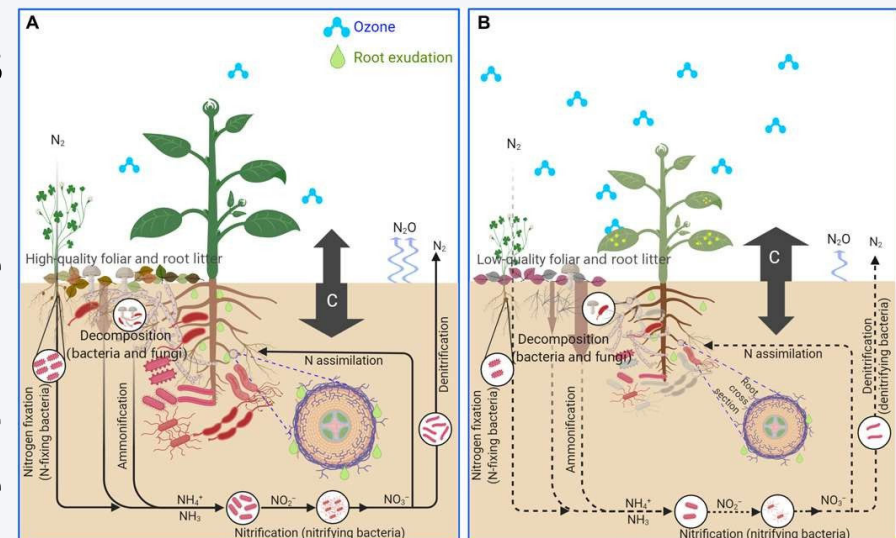
Water Storage and Flood Control

Air and water treatment

Some of the gases considered as criteria pollutants like NO_x and O₃, in moderate amounts, contribute to a healthy ecosystem and balanced biodiversity. However, due to excessive concentrations of these gases, the capacity of the environment to clean itself and to be resilient is diminished.



- Ozone found at ground level is known as bad ozone. It is created by chemical reactions between oxides of nitrogen and volatile organic compounds under the presence of sunlight.
- High levels of ground level ozone promote early flowering, affecting the synchronization of pollinators and flowers.

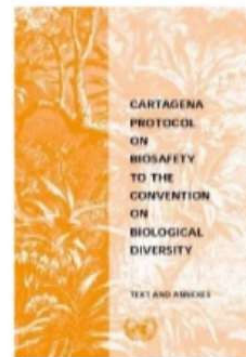


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The Montreal protocol is a model of cooperation. It is a product of the recognition and international consensus that ozone depletion is a global problem, both in terms of its causes and its effects. The protocol is the result of an extraordinary process of scientific study, negotiations among representatives of the business and environmental communities, and international diplomacy. It is a monumental achievement.

PRESIDENT RONALD REAGAN
1988

CARTAGENA PROTOCOL ON BIOSAFETY



- 2000
- 171 Parties
- Objective:
 - Safe use of living modified organisms (*focus on import and export*)
- Highlight: mandatory environmental risk assessments

Protocols in biodiversity



Summary

- Biodiversity loss will have a great negative effect especially to us humans since the “value of biodiversity is the value of everything”.
- We must recognize the value of the organisms with which we share the planet.
- A mitigating plan and a workable plan of action should be studied in order to not compromise biodiversity, while at the same time, promote good health among the society.



References

- <https://www.aip.org/history-programs/niels-bohr-library/ex-libris-universum/three-mile-island-1979-accident-and-its>
- <https://www.nationalgeographic.com/environment/2019/03/oil-spills-30-years-after-exxon-valdez/>
- <https://news.globallandscapesforum.org/44538/biodiversity-101-why-it-matters-and-how-to-protect-it/>
- <https://www.medicalnewstoday.com/articles/216798#history>
- <https://www.state.gov/key-topics-office-of-environmental-quality-and-transboundary-issues/the-montreal-protocol-on-substances-that-deplete-the-ozone-layer/>



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Thank you for
listening